

WE CLAIM:

- 1 -

A room-temperature liquid stable prepolymer (P) which is the reaction product of

a) methylene diphenylisocyanate or a prepolymer of methylene diphenylisocyanate and an about 500-1000 equivalent weight polytetramethylene ether glycol or polyoxypropylene/polyoxyethylene diol or triol having at least 21% residual NCO,

b) polytetramethylene ether glycol of about 500 to 1000 equivalent weight, and

c) a polyoxypropylene/polyoxyethylene triol or polyoxypropylene triol of about 1300 to 2000 equivalent weight,

the percentage by weight in the prepolymer (P) being about 32 to 72% of (a), about 52 to 22% of (b), and about 6 to 15% of (c), and the percentage of residual NCO in the prepolymer (P) being about 6 to 18% by weight,

the prepolymer (P) having a viscosity at room temperature of about 1200 to 26000 cps,

which prepolymer (P) is curable and castable at room temperature to yield a high-performance urethane elastomer.

- 2 -

The prepolymer(P) of Claim 1 wherein the percentage of residual NCO in the prepolymer(P) is about 11.5-13.5%

[illegible]

- 4 -

- 5 -

- 6 -

- 7 -

- 8 -

- 9 -

- 10 -

AZON3A/dln

0992780 11601

(1) a polyoxypropylene/-polyoxyethylene diol of about 1000 to 2000 equivalent weight, (2) a polyoxypropylene/-polyoxyethylene triol of about 1300 to 2000 equivalent weight, (3) a chain extender having an equivalent weight of about 25 to 125, (4) a room-temperature liquid stable prepolymer (P) having a 6 to 18% residual NCO, (5) a diluent, (6) a degassing aid, and (7) a urethane catalyst, the relative amounts by weight being respectively 30 - 90%, 3 - 20%, 5 - 30%, 0 - 30%, 0 - 15%, 0.001 - 0.05%, and 0.01 - 0.5%.

- 11 -

The prepolymer (P) of Claim 1 which is cured at room temperature with an approximately stoichiometric equivalent of a liquid curative consisting essentially of the following components:

(1) a polyoxypropylene/-polyoxyethylene diol of about 1000 to 2000 equivalent weight, (2) a polyoxypropylene/-polyoxyethylene triol of about 1300 to 2000 equivalent weight, (3) a chain extender having an equivalent weight of about 25 to 125, (4) a room-temperature liquid stable prepolymer (P) having a 6 to 18% residual NCO, (5) a diluent, (6) a degassing aid, and (7) a urethane catalyst, the relative amounts by weight being respectively 30 - 90%, 3 - 20%, 5 - 30%, 0 - 30%, 0 - 15%, 0.001 - 0.05%, and 0.01 - 0.5%.

- 12 -

The cured prepolymer of Claim 11 wherein the amounts of (4) and (5) in the curative are respectively 10-20 and 5-15% by weight.

- 13 -

The prepolymer (P) of Claim 1 which is curable at room temperature with an approximately stoichiometric equivalent of a liquid curative consisting essentially of the following components:

09992730-11601

(1) a polyoxypropylene/-polyoxyethylene diol of about 1000 to 2000 equivalent weight, (2) a polyoxypropylene/-polyoxyethylene triol of about 1300 to 2000 equivalent weight, (3) a chain extender having an equivalent weight of about 25 to 125, (4) a room-temperature liquid stable prepolymer (P) having a 6 to 18% residual NCO, (5) a diluent, (6) a degassing aid, and (7) a urethane catalyst, the relative amounts by weight being respectively 30 - 90%, 3 - 20%, 5 - 30%, 0 - 30%, 0 - 15%, 0.001 - 0.05%, and 0.01 - 0.5% to give a cured urethane elastomer having the following properties after mixing and curing for seven days at room temperature:

Tensile strength (ASTM Method D-412)	about 1300-2700 psi
Elongation (ASTM Method D-412)	about 250-700%
Die C Tear (ASTM Method D-695)	about 140-400 pli
Split Tear (ASTM Method D-1938)	about 20-100 pli
Rebound (ASTM Method D-2632)	about 45-65%
Shore A Hardness (ASTM Method D-2240)	about 70-95
Gel time (25°C)	about 14-40 min..

- 14 -

The prepolymer (P) of Claim 2 which is cured at room temperature with an approximately stoichiometric equivalent of a liquid curative consisting essentially of the following components:

(1) a polyoxypropylene/-polyoxyethylene diol of about 1000 to 2000 equivalent weight, (2) a polyoxypropylene/-polyoxyethylene triol of about 1300 to 2000 equivalent weight, (3) a chain extender having an equivalent weight of about 25 to 125, (4) a room-temperature liquid stable prepolymer (P) having a 6 to 18% residual NCO, (5) a diluent, (6) a degassing aid, and (7) a urethane catalyst, the relative amounts by weight being respectively 30 - 90%, 3 - 20%, 5 - 30%, 0 - 30%, 0 - 15%, 0.001 - 0.05%, and 0.01 - 0.5% and a room-temperature viscosity of about 300-50000 cps, to give a cured urethane elastomer having the following properties

after mixing and curing for seven days at room temperature:

Tensile strength (ASTM Method D-412)	about 1300-2700 psi
Elongation (ASTM Method D-412)	about 250-700%
Die C Tear (ASTM Method D-695)	about 140-400 pli
Split Tear (ASTM Method D-1938)	about 20-100 pli
Rebound (ASTM Method D-2632)	about 45-65%
Shore A Hardness (ASTM Method D-2240)	about 70-95
Gel time (25°C)	about 14-40 min..

- 15 -

The cured prepolymer of Claim 14 wherein the amounts of (4) and (5) in the curative are respectively 10-20 and 5-15% by weight.

- 16 -

The cured product of Claim 14 wherein the prepolymer (P) is present in an up to about 13% stoichiometric excess with respect to the curative.

- 17 -

The cured product of Claim 16 wherein the prepolymer (P) is present in about a 2 to 7% stoichiometric excess with respect to the curative.

- 18 -

The prepolymer (P) of Claim 2 wherein the percentages by weight of a), b), and c) are respectively about 54%, about 36%, and about 10%.

- 19 -

The prepolymer (P) of Claim 18 cured with an approximately stoichiometric equivalent of a curative consisting essentially of (1) a polyoxypropylene/-polyoxyethylene diol of about 1000 to 2000 equivalent weight, (2) a polyoxypropylene/-polyoxyethylene triol of about 1300 to 2000 equivalent weight, (3) a chain extender having an equivalent weight of about 25 to 125, (4) a room-temperature liquid stable prepolymer (P) having a 11.5 to 13.5% residual NCO, (5) a diluent, (6) a degassing aid, and (7) a urethane catalyst, the relative amounts by weight being respectively approximately 54%, 13%, 10%, 15%, 8%, 0.005% and 0.006%.

- 41 -

AZON3A/dln

0992780.112301
FOIA b 7 - D

- 20 -

The cured prepolymer (P) of Claim 19 wherein the curative has a viscosity at room temperature of about 3000-5000 cps and a specific gravity of about 1.05-1.08.

- 21 -

The cured product of Claim 20 wherein the prepolymer (P) is present in an up to about 13% stoichiometric excess with respect to the curative.

- 22 -

The cured product of Claim 21 the prepolymer (P) is present in about a 2 to 7% stoichiometric excess with respect to the curative.

- 23 -

The cured prepolymer (P) of Claim 22 wherein the properties after mixing and curing for seven days at room temperature are as follows:

Tensile strength (ASTM Method D-412)	about 1550psi
Elongation (ASTM Method D-412)	about 500%
Die C Tear (ASTM Method D-695)	about 250 pli
Split Tear (ASTM Method D-1938)	about 45 pli
Rebound (ASTM Method D-2632)	about 55%
Shore A Hardness (ASTM Method D-2240)	about 80
Gel time (25°C)	about 20-30 min..

- 24 -

The cured prepolymer (P) of Claim 23 wherein the degassing aid is a silicone emulsion.

- 25 -

The cured prepolymer (P) of Claim 23 wherein the catalyst is a mixture of triethylene diamine and 2,3-dimethyltetrahydropyrimidine or bismuth neodecanoate.

- 26 -

The cured prepolymer (P) of Claim 23 wherein the degassing aid is a silicone emulsion and the catalyst is a mixture of triethylene diamine and 2,3-dimethyltetrahydropyrimidine or bismuth neodecanoate.

- 27 -

A kit comprising the separately packaged prepolymer (P) of Claim 1, and a separately packaged curative consisting essentially of (1) a polyoxypropylene/-polyoxyethylene diol of about 1000 to 2000 equivalent weight, (2) a polyoxypropylene/-polyoxyethylene triol of about 1300 to 2000 equivalent weight, (3) a chain extender having an equivalent weight of about 25 to 125, (4) a room-temperature liquid stable prepolymer (P) having a 6 to 18% residual NCO, (5) a diluent, (6) a degassing aid, and (7) a urethane catalyst, the relative amounts by weight being respectively 30 - 90%, 3 - 20%, 5 - 30%, 0 - 30%, 0 - 15%, 0.001 - 0.05%, and 0.01 - 0.5%.

- 28 -

The kit of Claim 27 wherein the curative has a viscosity at room temperature of about 300-50000 cps and a specific gravity of about 1.02-1.15.

- 29 -

A kit comprising the separately packaged prepolymer (P) of Claim 2, and a separately packaged curative consisting essentially of (1) a polyoxypropylene/-polyoxyethylene diol of about 1000 to 2000 equivalent weight, (2) a polyoxypropylene/-polyoxyethylene triol of about 1300 to 2000 equivalent weight, (3) a chain extender having an equivalent weight of about 25 to 125, (4) a room-temperature liquid stable prepolymer (P) having a 6 to 18% residual NCO, (5) a diluent, (6) a degassing aid, and (7) a urethane catalyst, the relative amounts by weight being respectively 30 - 90%, 3 - 20%, 5 - 30%, 0 - 30%, 0 - 15%, 0.001 - 0.05%, and 0.01 - 0.5% and a room-temperature viscosity of about 300-50000 cps.

